

The Magic School Bus



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The Magic School Bus[®]



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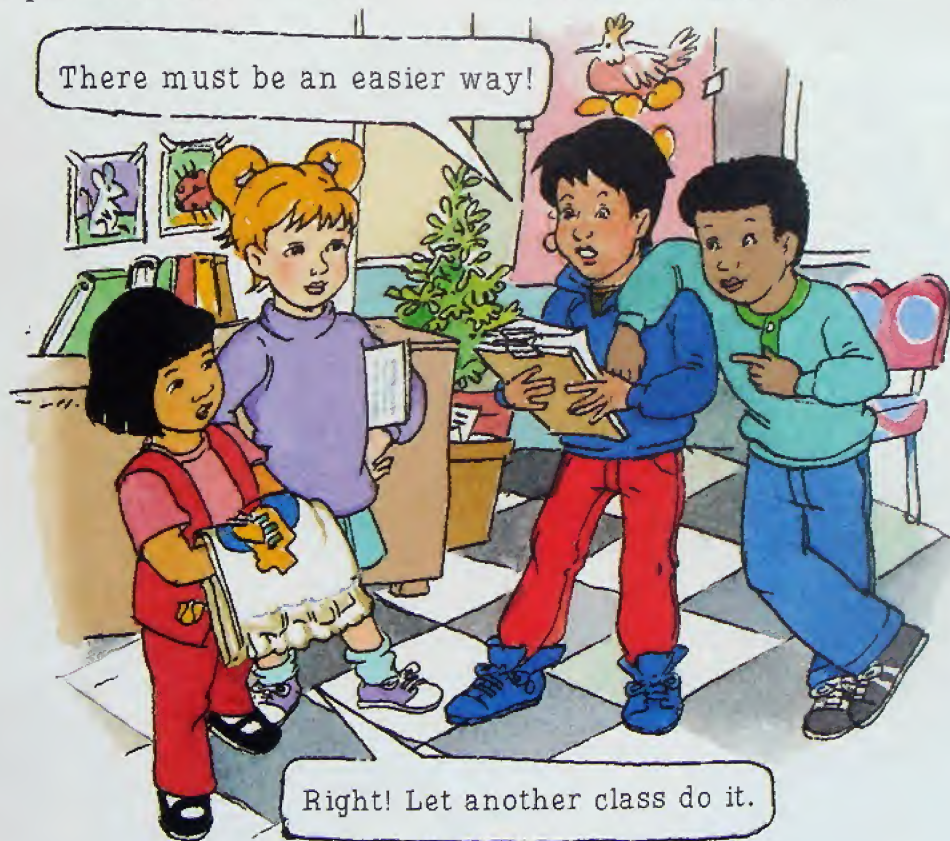
A BOOK ABOUT COMPUTERS



SCHOLASTIC INC.

New York Toronto London Auckland Sydney
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You wouldn't believe the crazy things that happen in Ms. Frizzle's class! Like the day it was our class's turn to open the school. We came to school early and got our job list: ring the bell, unlock the doors, raise the flag, make up a greeting for the day, turn on the lawn sprinklers, set up the coffee machine in the teachers' room, prepare attendance sheets. . . . There was so much to do!



While we were wondering how we could do all those jobs, Mr. McLean came in with a humongous box. He told us that Mr. Ruhle, our principal, wanted us to set up what was inside — whatever it was.



You know how I said crazy things happen in Ms. Frizzle's class? Before we even opened the box, one of those things happened. Ms. Frizzle popped out!



Then she announced, "Mr. Ruhle's new super-duper computer has arrived!"

"A computer!" shouted Carlos. "That's it! We'll get the computer to do our jobs!"

Sometimes Carlos has good ideas, and this was definitely one of those times.

First we hooked up the screen (which, by the way, is called the *monitor*). Then we plugged the keyboard into the main part of the computer. We plugged in the mouse and the printer, too. Carlos turned on the computer. But it didn't do much of anything.

"Right now," explained Ms. Frizzle, "this computer is just an idle machine. It needs instructions to tell it what to do."

"But we don't know how to give it instructions," said Carlos. "What we need is a computer expert to help us!"



Boy, were we happy when the very person we needed wheeled into our classroom. It was Carlos's little brother, Mikey — the computer dude! Luckily for us, Mikey had come to school early to clean out his desk.

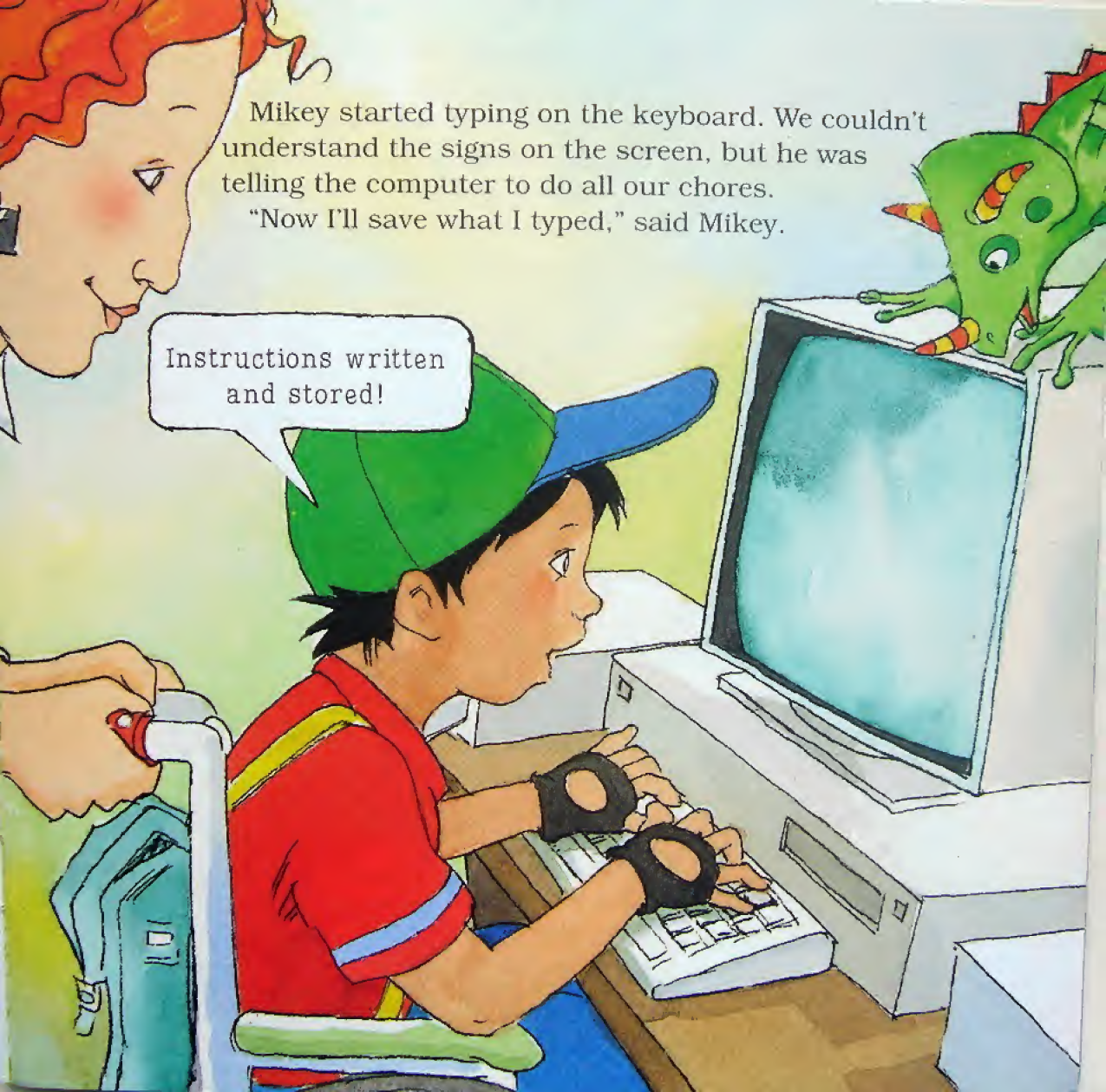


Mikey sure didn't waste any time. He started plugging cables into the computer. He told us to go out and plug the free ends of the cables into the bell, the doors, the flagpole, the loudspeaker, the sprinkler, and the coffee machine. When we came back into the classroom, Mikey told Carlos to record this morning's greeting. Here's what Carlos said into the tape recorder:

"Hi! How are you? Nice to see you! Thanks for coming to school, and enjoy your day!"

Then Mikey plugged the tape recorder into the computer, too.



A colorful illustration of a young boy with black hair, wearing a green baseball cap and a red t-shirt with a yellow and blue stripe on the sleeve. He is sitting in a white office chair, typing on a white keyboard. He is looking at a large, light blue computer monitor. On top of the monitor, a green dragon with yellow and red striped horns is perched. The dragon has a small red saddle on its back. The background is a simple light blue and yellow gradient. A woman with red hair is partially visible on the left side of the frame, looking towards the boy. A speech bubble from the woman contains the text "Instructions written and stored!".

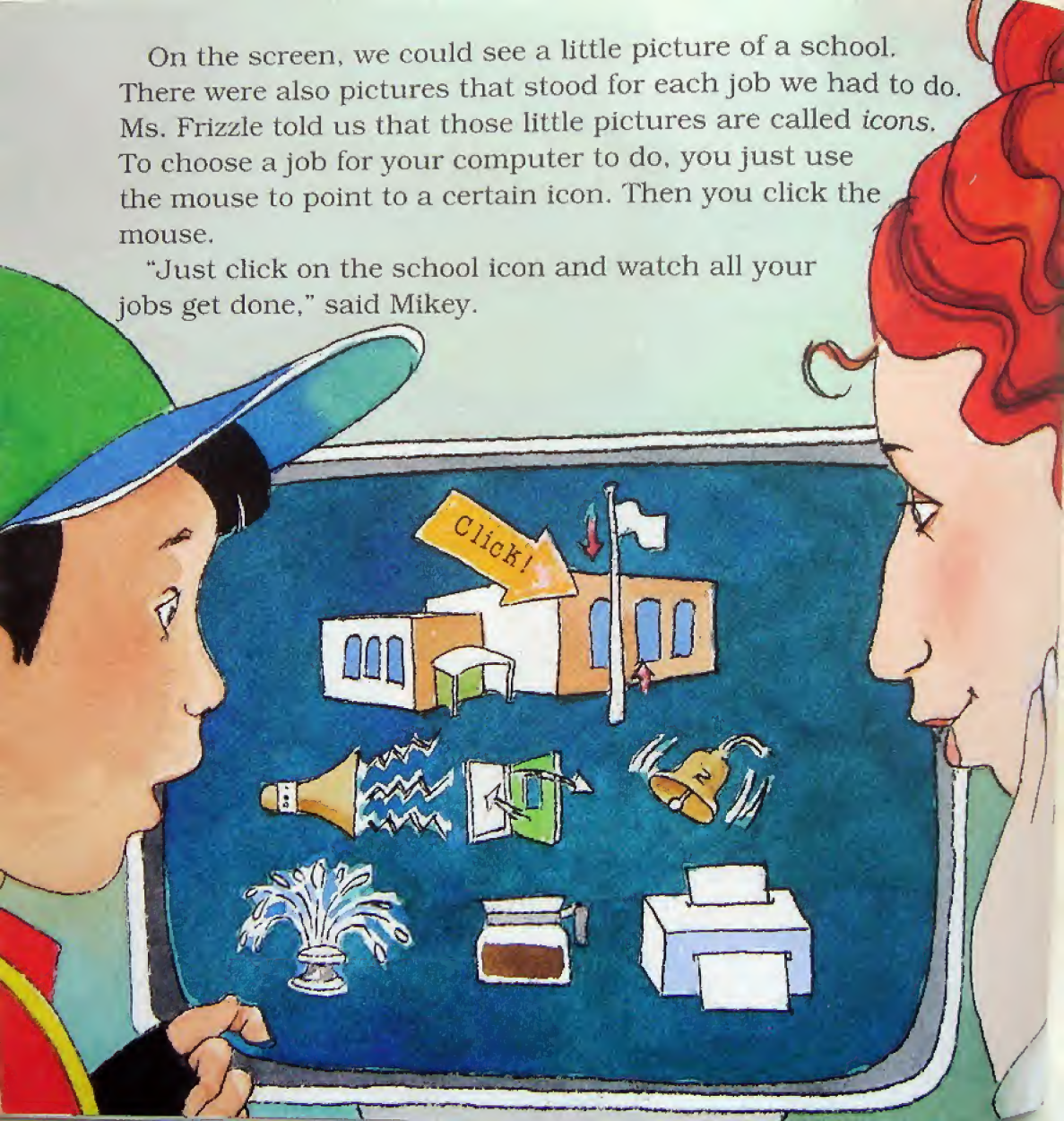
Mikey started typing on the keyboard. We couldn't understand the signs on the screen, but he was telling the computer to do all our chores.

"Now I'll save what I typed," said Mikey.

Instructions written
and stored!

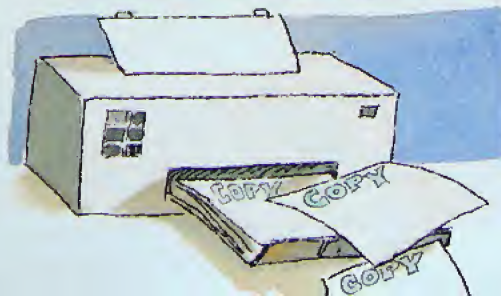
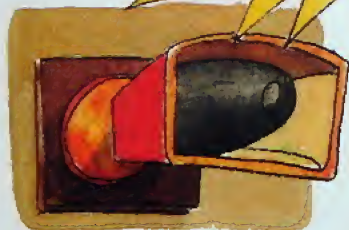
On the screen, we could see a little picture of a school. There were also pictures that stood for each job we had to do. Ms. Frizzle told us that those little pictures are called *icons*. To choose a job for your computer to do, you just use the mouse to point to a certain icon. Then you click the mouse.

"Just click on the school icon and watch all your jobs get done," said Mikey.



We couldn't believe it, but everything started happening at once. We even heard Carlos greeting the school over the loudspeaker.

Hi! How are you?
Nice to see you!



"Way to go, Mikey!" we all cheered.

But Mikey wasn't listening to us. He was looking inside the computer. He looked as if he were trying to get inside the computer!

"Boy, I'd love to know what it's like in there," he said. "I mean, what really happens to my instructions once I've typed them?"

Time for a field trip, Mikey!

Awesome!



Ms. Frizzle was getting ready to send Mikey *inside the computer*! She put a set of earphones on his head.

"Now you can have your own guided tour," she promised. "And since the fastest way to get information into a computer is on a disk," she continued, "take a risk and make like a floppy disk!"

Mikey's chair started spinning around really fast. As it spun, it got flatter and flatter until Mikey turned into a disk! Then, like magic, the disk floated right into an opening in the computer.



We were still staring at the computer — with Mikey inside — when things got really weird. The school bell rang again. Carlos's greeting came over the loudspeaker again. From the window, we could see the flag coming down and going back up the flagpole, and the sprinkler went on right in Mr. McLean's face. The computer was doing all our jobs — all over again!

The computer's doing something wrong.

Mikey can fix it.

But Mikey's inside the computer!

We've got to get him back!



The next thing we knew, the computer was doing all our jobs *for the third time*. In fact, it was repeating our jobs *every minute*! We were in big trouble now.

"Let's go in there and get Mikey out before Mr. Ruhle gets here," suggested Phoebe.

"Splendid idea, Phoebe," said the Friz, getting that twinkle in her eye.

You know our school bus is magic, but did I remember to mention that it comes when the Friz whistles? Well, it does.



We all climbed aboard the MSB — except for Arnold. He volunteered to stay behind in case Mr. Ruhle showed up early. When we all started to shrink, I began to think Arnold had a good idea!



So this is where the floppies go!

To the drive-in disk-o!

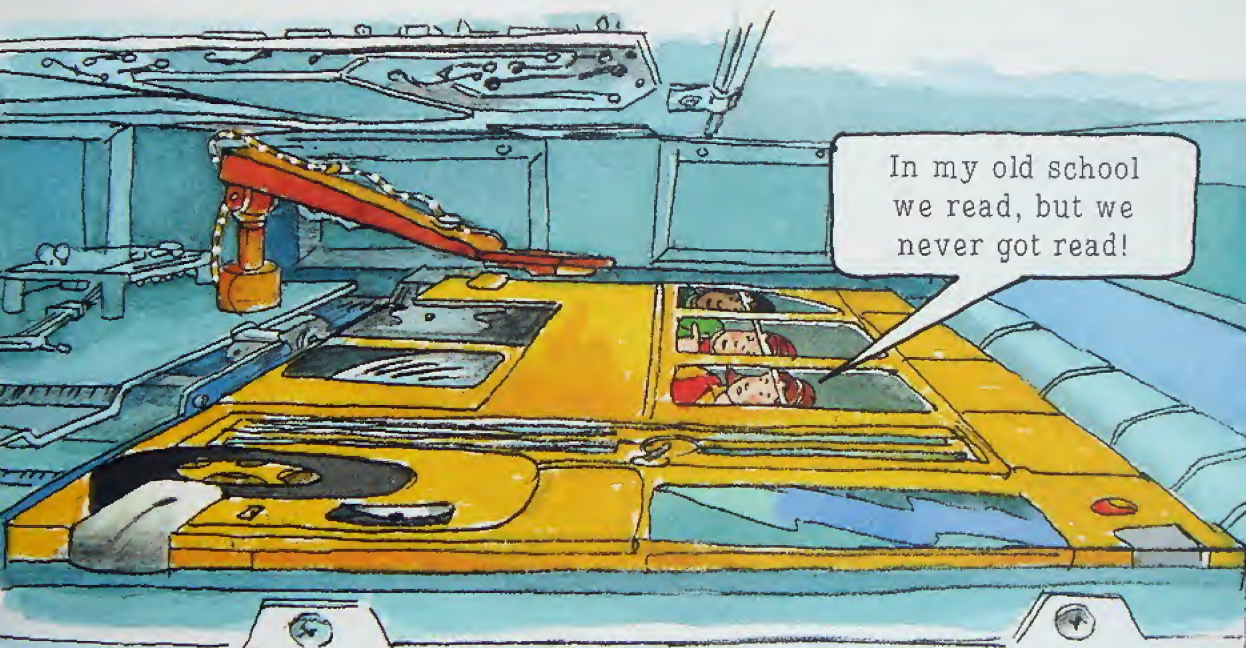


"A diskette, a daskette, the bus'll turn into a floppy disk if we ask it!" sang Ms. Frizzle. I'll bet you can guess what happened next:

Inside the disk drive, a motor started spinning us around fast. Then something that looked like a long metal toothbrush began sliding along the disk.

"What's with the toothbrush thing?" Carlos asked.

"That's the read/write head. It's reading instructions and other information stored on the floppy disk," Ms. Frizzle explained.



"It will change the information on the disk into electrical signals and send it to the main part of the computer."

The read/write head was getting awfully close, when the Friz said, "OK, bus, do your stuff!" Just in time, the bus turned into a teeny blimp — with us in it! Now we had a really good view of the inside of the computer, but we couldn't see Mikey anywhere.

"Wait!" said Wanda. "Mikey was going to find out what happened to his instructions, right? And instructions are information, right? And the information is in those flashing signals, right? So if we follow the signals — we find Mikey!"

Right, Wanda! Let's follow the yellow-lit road!



Would you believe that panels in the ceiling of the bus opened, and skateboards came down for all of us? If you've ever been in Ms. Frizzle's class, you can believe anything!

Next thing we knew, we were skateboarding through the inside of the computer.



Time to skateboard to the motherboard!



The information goes
Electricity Express!



"Wow! Where are we?" asked Wanda.

"You're skating on the cables that run from the disk drive to the motherboard. The motherboard is the heart of the computer!" shouted Ms. Frizzle from the blimp.

The motherboard was full of wires. And the wires were carrying electrical signals like the ones coming in from our floppy disk.

"This must be how information travels around the computer," said Ralphie.

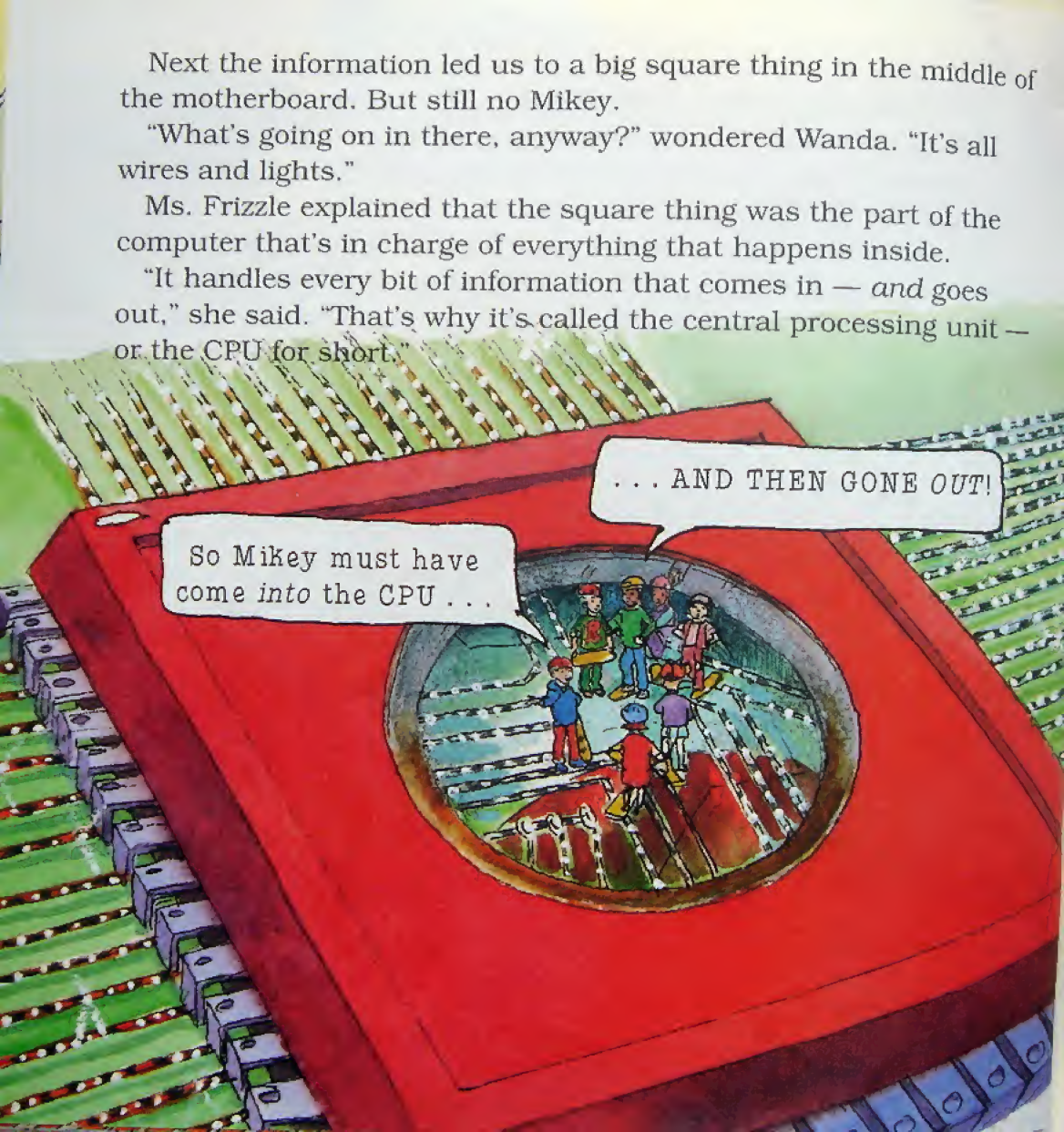


Next the information led us to a big square thing in the middle of the motherboard. But still no Mikey.

"What's going on in there, anyway?" wondered Wanda. "It's all wires and lights."

Ms. Frizzle explained that the square thing was the part of the computer that's in charge of everything that happens inside.

"It handles every bit of information that comes in — *and goes out*," she said. "That's why it's called the central processing unit — or the CPU for short."

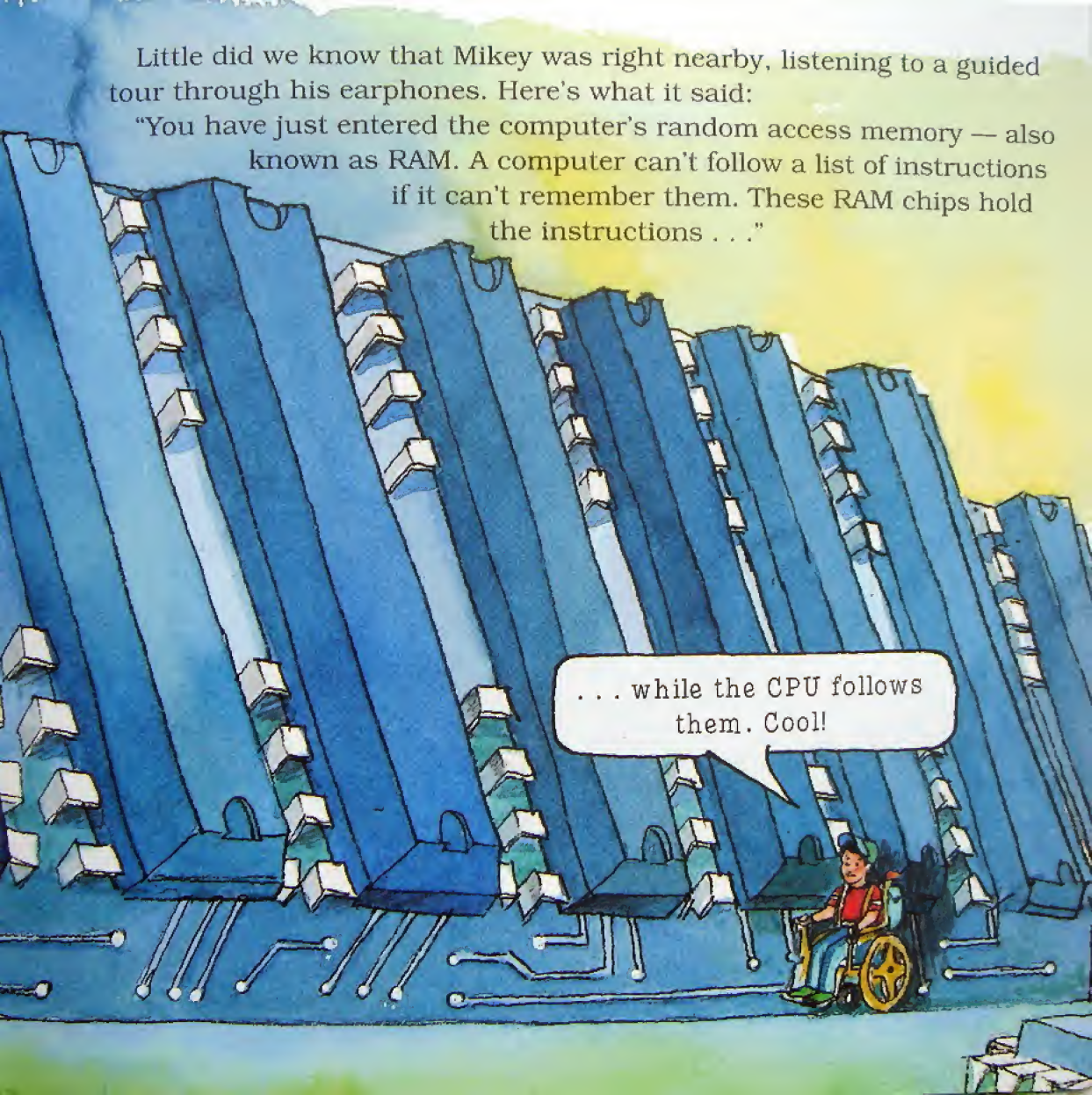


So Mikey must have
come *into* the CPU . . .

. . . AND THEN GONE *OUT*!

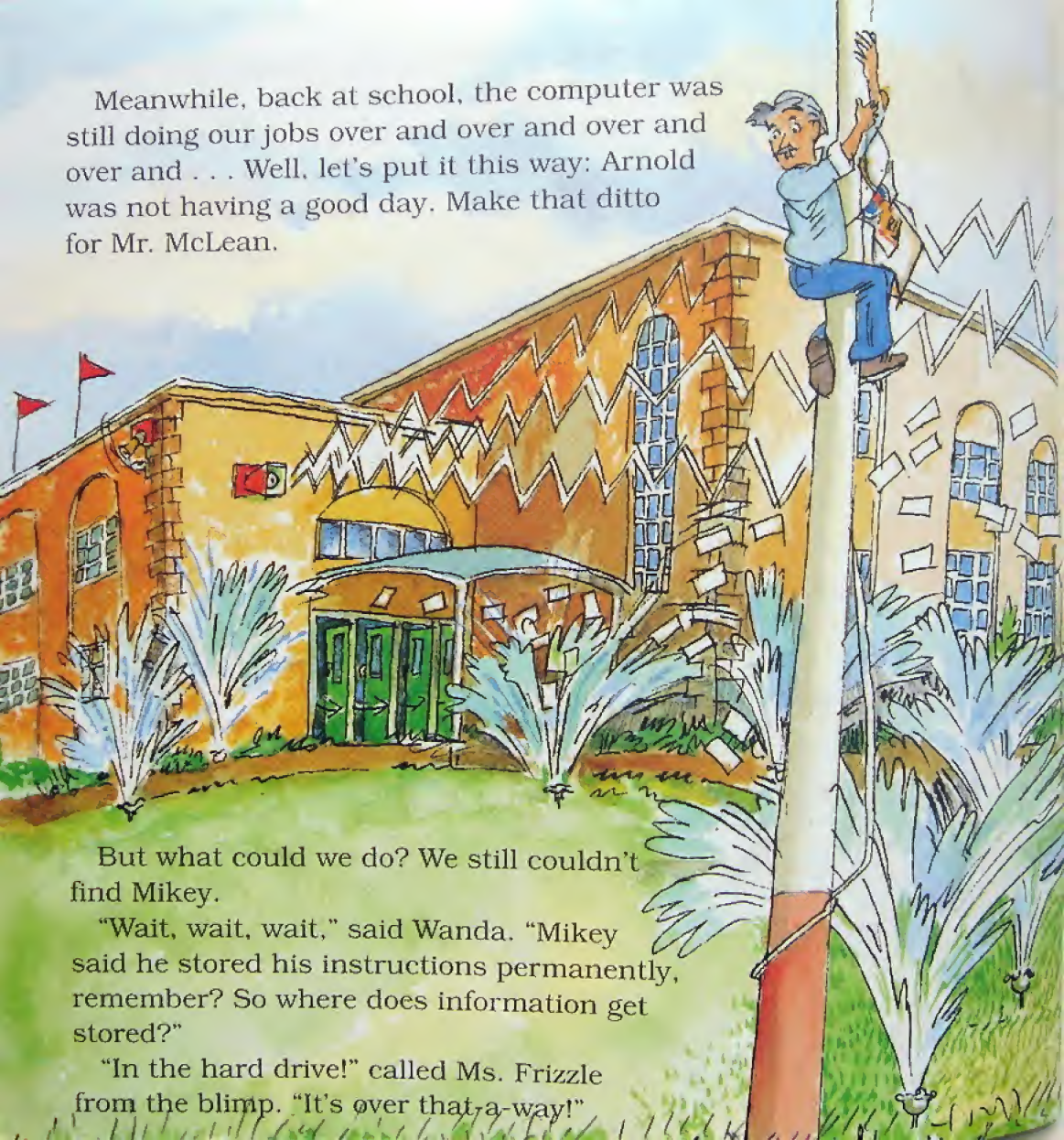
Little did we know that Mikey was right nearby, listening to a guided tour through his earphones. Here's what it said:

"You have just entered the computer's random access memory — also known as RAM. A computer can't follow a list of instructions if it can't remember them. These RAM chips hold the instructions . . ."



. . . while the CPU follows them. Cool!

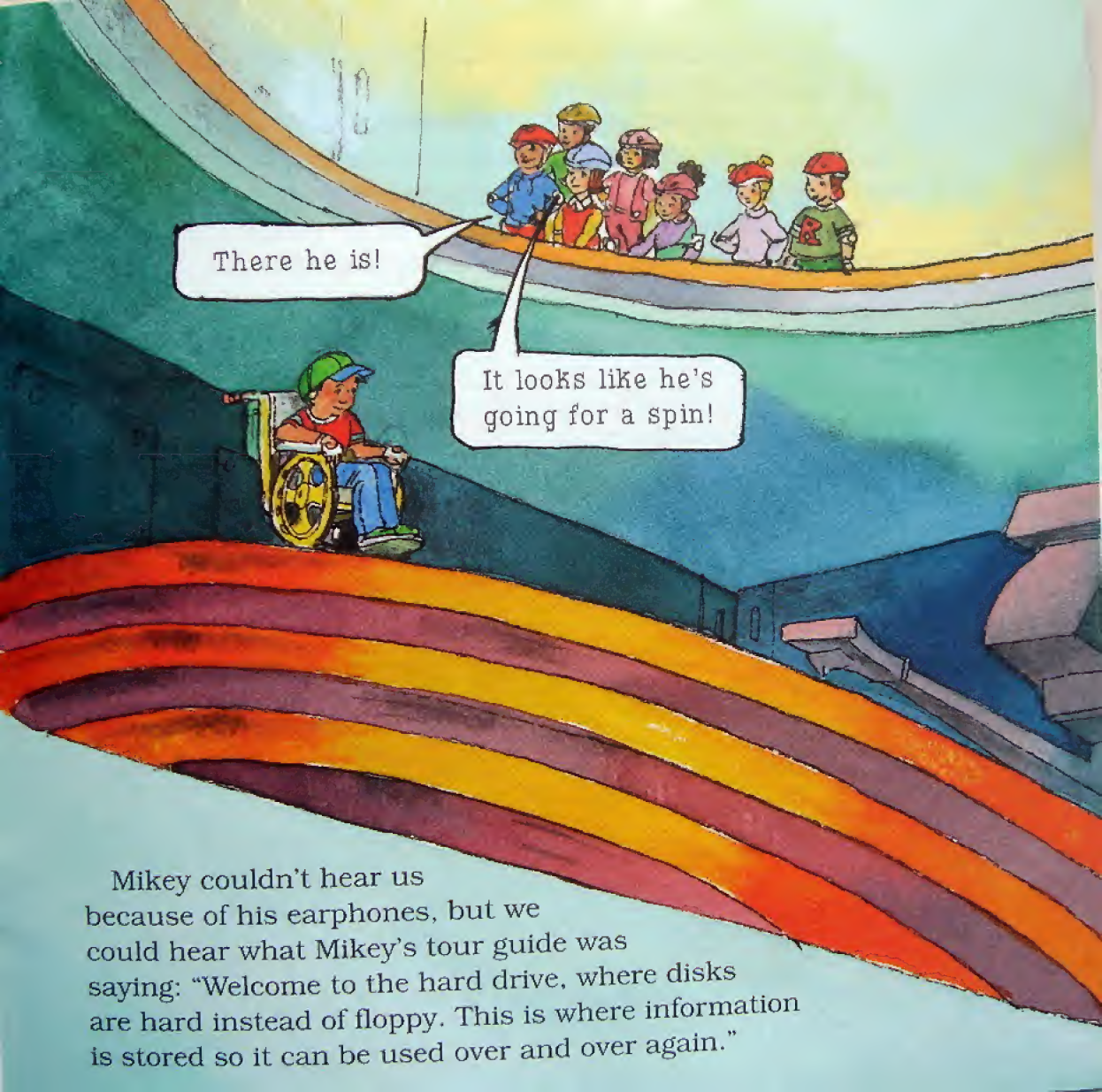
Meanwhile, back at school, the computer was still doing our jobs over and over and over and over and . . . Well, let's put it this way: Arnold was not having a good day. Make that ditto for Mr. McLean.



But what could we do? We still couldn't find Mikey.

"Wait, wait, wait," said Wanda. "Mikey said he stored his instructions permanently, remember? So where does information get stored?"

"In the hard drive!" called Ms. Frizzle from the blimp. "It's over that-a-way!"



There he is!

It looks like he's
going for a spin!

Mikey couldn't hear us because of his earphones, but we could hear what Mikey's tour guide was saying: "Welcome to the hard drive, where disks are hard instead of floppy. This is where information is stored so it can be used over and over again."

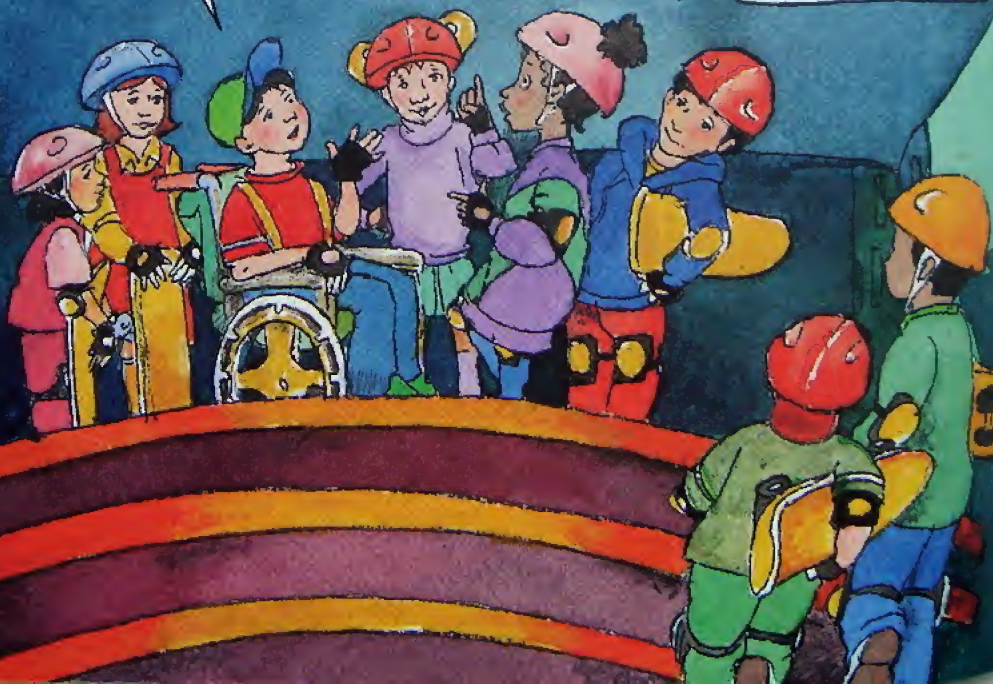
"Mikey!" shouted Dorothy Ann. "You gotta help us. Something's wrong with the computer!"

"Wrong?" said Mikey, who had finally taken off his headphones. "I checked everything out, and it's working great. Information's coming from the keyboard and the floppy disk and getting changed into electrical signals just like it's supposed to. And the CPU's deciding what to do with 'em."

Everything's A-OK
in here.

Well, it's not
A-OK out there!

The computer's
doing our jobs
over and over!

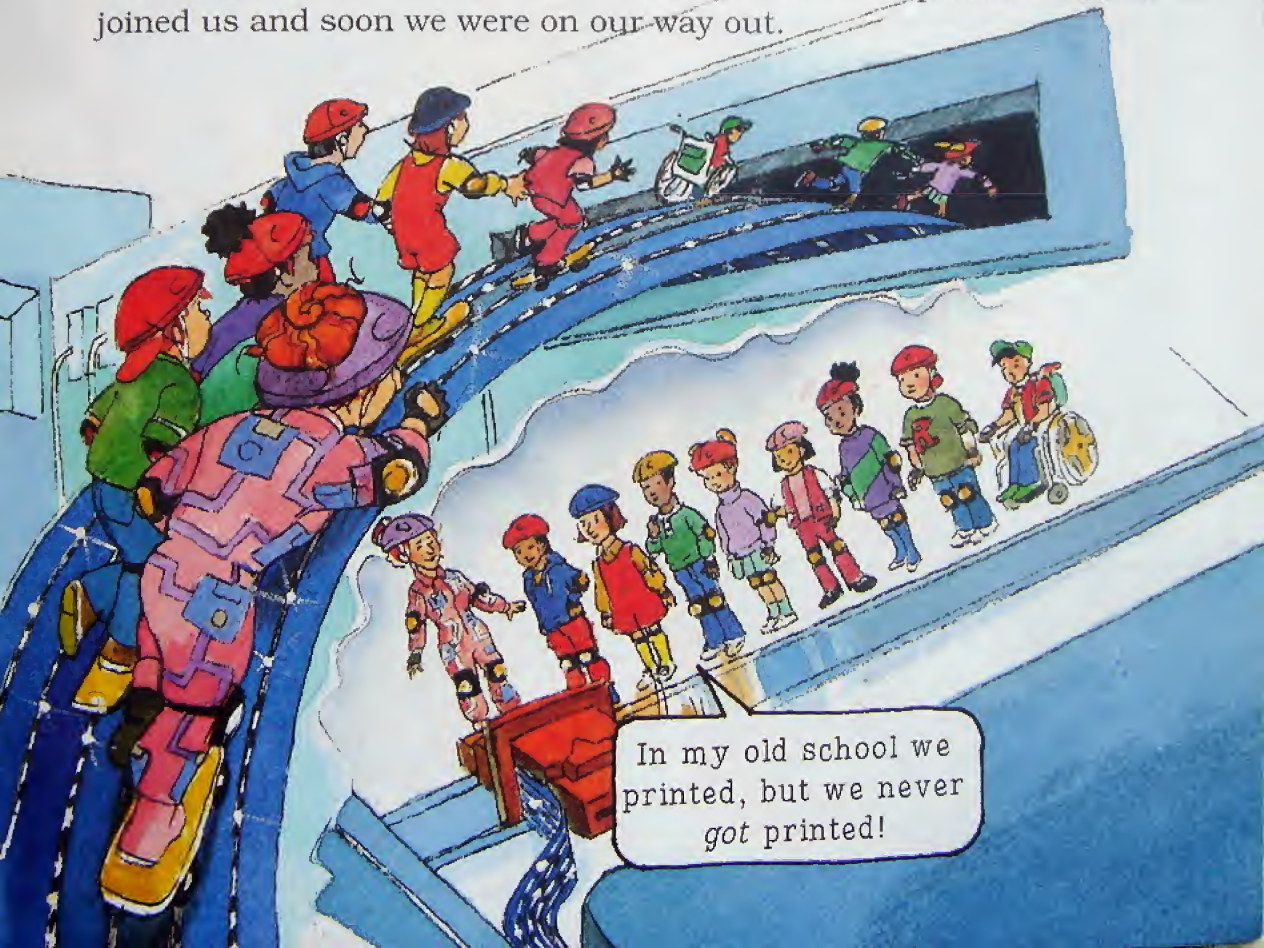


"We've got to get out of here!" yelled Wanda.

"No sweat!" said Mikey. "Computers send information out as well as bring it in. We'll just go out with the output."

"Look!" shouted Ms. Frizzle from the blimp. "There's some information on its way out to the printer now. Just go with the flow!"

Don't ask me how, but the whole blimp turned into a bunch of skateboards, and we followed the information to the printer. The Friz joined us and soon we were on our way out.



In my old school we
printed, but we never
got printed!

Boy, was Arnold ever happy to see us popping out of the printer!

Mikey went straight to the computer, while Ms. Frizzle explained to us that a computer isn't really smart. It's just a machine.

"A computer needs instructions it can understand to tell it what to do and how to do it," she said. "Those instructions are called a *program*."

"And if there's even one teeny-weeny mistake in the program," added Mikey, "everything goes kafooey!"

And anyone can make a mistake — even Mikey.

I guess there's a first time for everything!



Mikey printed out his program so we could check it out. "Let's see," he said. "Bell, doors, flag, greeting, sprinklers, coffee, attendance sheets . . ."



"No wonder everything is happening again and again," said Mikey. "The computer's doing just what I told it to do!"

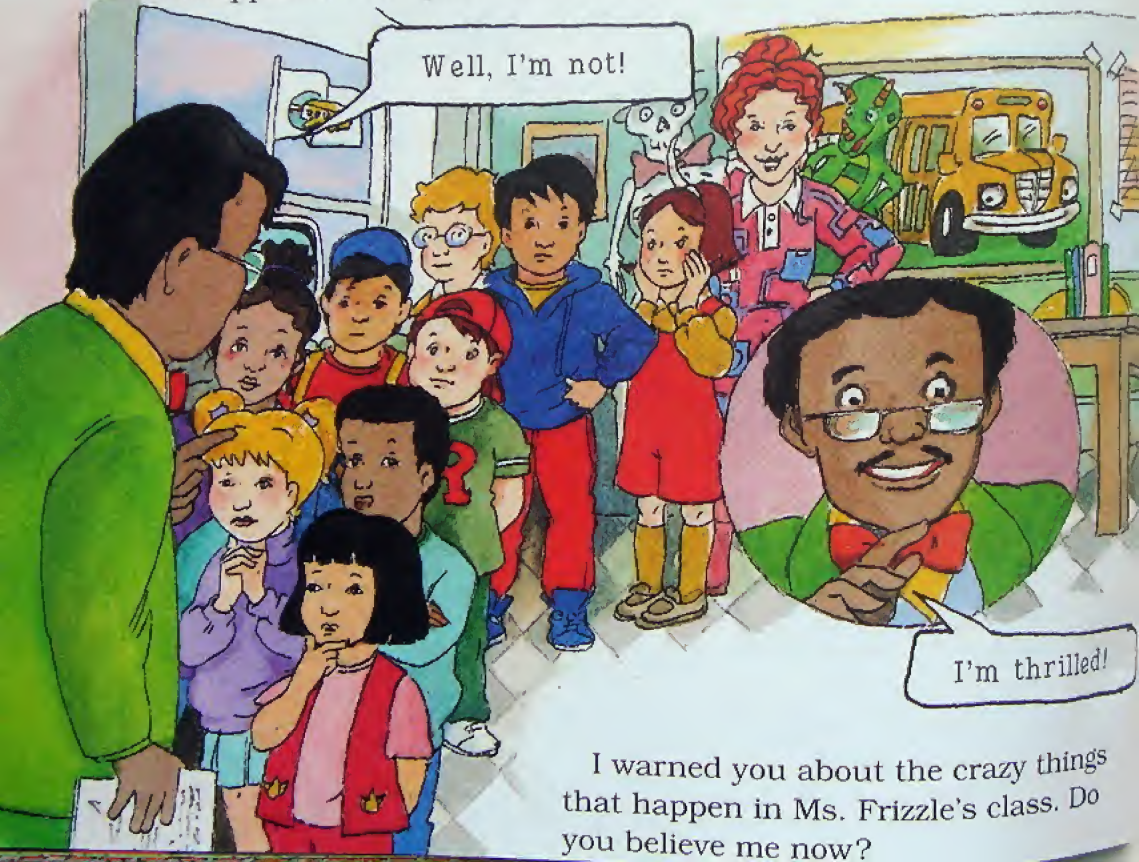
"Which is all computers ever do," chimed in the Friz.

Mikey changed the word *minute* to *day*, stored the new and improved program in the hard drive, and we were up and running!

Just in time, too. Because Mr. Ruhle was on his way to our classroom!
"What's going on here?" he asked. "The school seems to be getting ready *by itself*!"

When we explained that the computer was doing our jobs for us, Mr. Ruhle looked mad. He said he had told us to set up the computer, not program it.

"Am I supposed to be pleased?" he asked.



I warned you about the crazy things that happen in Ms. Frizzle's class. Do you believe me now?

Letters to Mikey

(Editor's note: They will help you tell what is real and what is make-believe in this story.)

Dear Mikey,

My little sister's a computer whiz, like you. She told me that you can't really see the electronic signals in a computer. I guess the illustrator made them visible just so we kids — and the kids in the book — could follow them.

Sis of Whiz



Dear Mikey,

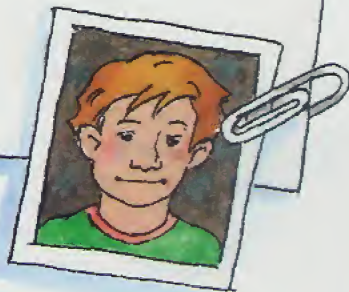
We asked our teacher if you can really make a computer do your work for you, like you guys did. He said that since computers can turn switches on and off, anything that can be run by a motor can be run by a computer. Of course, the instructions have to be perfect — but you know that already, Mikey (ha-ha).

Smart E. Pants

Dear Mikey,

We once took apart a real computer in school, and the insides were much more complicated than the one you were in. The main parts were the same, though — disk drive, motherboard, CPU, hard drive, and RAM. No blimp, no skateboards.

Noah Kidding

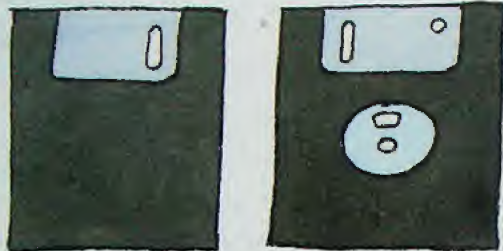


What's So Floppy About a Floppy Disk?

An Activity for Parents and Children

A 3.5" computer disk doesn't look or feel floppy at all. So why is it called a "floppy disk"? You can find the answer by "dissecting" a disk. (An empty one!)

①



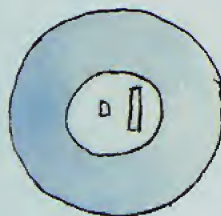
1. Look at your disk. What you see is really the *housing*, or *disk case*. The disk itself is inside. The metal thing is the *shutter*. Slide the shutter so you can see the disk underneath. The shutter protects the disk when it's out of the computer.

②



2. Use a butter knife to pry off the shutter. Then pry apart the two halves of the housing. (Don't worry if the housing breaks.)

③



3. There's the disk! It's the brown or black plastic circle with a metal center. Pick it up. See why it's called "floppy"? The metal center, or *hub*, keeps the disk in place while it spins.

Uh-oh, we're out of space! If you want to know more about how a disk works, take Ms. Frizzle's advice. Make like a scientist and research! Look in a book about computers, or in an encyclopedia.

